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November 29, 2013

VIA ELECTRONIC SUBMISSION

Southeast Regional Office
Massachusetts Department of Environmental Protection
20 Riverside Drive
Lakeville, MA 02347
Attn: Wetlands Section

Re: Request for Review Pursuant to 310 CMR § 10.06(5)
Regarding Emergency Certification Request
Applicant – Siasconset Beach Preservation Fund, Inc.
Property Location – Sconset Bluff, Nantucket
From No. 91 Baxter Road to No. 105 Baxter Road

Dear Sir/Madam:

On behalf of Siasconset Beach Preservation Fund, Inc., ("SBPF") the party requesting permission to perform emergency work and certification of emergency status pursuant to 310 CMR 10.06 in the above-referenced matter, we hereby submit this letter that, together with the attachments (some of which are provided by electronic link), constitutes SBPF's Request for Review pursuant to 310 C.M.R. § 10.06(5) (the "Request for Review"). SBPF's Request for Review pertains to a Request for Certification of Emergency: Sconset Bluff – Baxter Road (the "Initial Request") submitted to the Nantucket Conservation Commission (the "Commission") on November 26, 2013. A copy was provided to Mr. David Johnston, Deputy Regional Director DEP SERO, and a link to the attachments to the Initial Request was provided to your office.

On November 27, 2013, the Commission met to consider the Initial Request, and at that meeting a vote was taken to deny the request. While it is clear that the Commission has voted to deny, it is not yet clear whether a written order or decision will follow. Regardless of whether any writing may be forthcoming, the matter is ripe for review by DEP SERO at this time. If the vote itself constitutes denial within the meaning of 310 CMR § 10.06(5), then review is appropriate and if the vote by itself does not constitute denial within the meaning of 310 CMR § 10.06(5), then the matter is appropriate for review at this time under the provisions of 310 CMR § 10.06(5) that govern in the absence of grant or denial within 24 hours of receipt of a request for emergency certification.

The work that is proposed (the "Emergency Project") is required in response to the ongoing erosion of Sconset Bluff (sometimes called "Siasconset Bluff") which has reached the point of posing an immediate threat in the current storm season to Baxter Road, a public way, and associated utilities as well as the homes seaward and landward of Baxter Road in the from No. 91 to No. 105 Baxter Road shown s the "Emergency Project Area" on the project plans submitted herewith. Because significant analysis has been done in connection with two distinct notices of intent (Baxter Road Temporary Stabilization Project, DEP File No. 048-2610 and Baxter Road and Sconset Bluff Storm Damage Prevention Project, DEP File No. 048-2581), both of which are presently pending before the Commission, we are able to present more complete information than is sometimes the case with respect to a request for emergency certification.

As a result of the substantial analysis that has been undertaken in connection with the pending Notices of Intent, sufficient information has been developed so that the proposed Emergency Project minimizes, mitigates, and provides monitoring protocols for any perceived impacts on third-parties, as is more fully set forth in the memos from Milone & MacBroom dated November 1, 2013, November 12, 2013, and November 19, 2013; the memo from Epsilon Associates dated November 1, 2013; and the correspondence from Dr. Michael Bruno dated November 25, 2013, submitted herewith (with which we have included Dr. Bruno's resume for your convenience). The harm that will result from failing to certify that emergency and permit the Emergency Project to go forward together with the potential for removal of the Proposed Project should that prove necessary, far outweighs any risks thought to be associated with the proposed work.

I. PROJECT BACKGROUND

The work that is proposed (the "Emergency Project") is required in response to the ongoing erosion of Sconset Bluff (sometimes called "Siasconset Bluff") which has reached the point of posing an immediate threat in the current storm season to Baxter Road, a public way, and associated utilities as well as the homes seaward and landward of Baxter Road in the "Emergency Project Area" shown on the project plans submitted herewith. Because significant analysis has been done in connection with two distinct notices of intent (Baxter Road Temporary Stabilization Project, DEP File No. 048-2610 and Baxter Road and Sconset Bluff Storm Damage Prevention Project, DEP File No. 048-2581), both of which are presently pending before the Commission, we are able to present more complete information than is sometimes the case with respect to a request for emergency certification.

The Emergency Project is proposed for 91-105 Baxter Road in accordance with the emergency criteria set forth in the memo from Epsilon Associates dated November 25, 2013, submitted herewith. Other than the proposed reduction in length of coverage, the Emergency Project is similar to the Baxter Road Temporary Stabilization Project (DEP File No. 048-2610) for 85-107A Baxter Road described in detail in the letters and plans submitted during the NOI process by Milone & MacBroom dated October 25, 2013, November 1, 2013, November 5, 2013, and November 19, 2013, submitted herewith. In overview, the Emergency Project involves the installation of four 45-foot circumference geotextile tubes, which are approximately

19 wide, 6.5 feet tall, and 100-200 feet long. The bottom tube will be buried in the beach to elevation 0.0 MLW and the top tube will be set at elevation 26.0 MLW. A scour apron and four-foot-diameter anchor tube are included, extending five feet seaward of the lowest geotextile tube at elevation 0.0 MLW. The four geotubes will overlap by approximately 1/3 of their circumference, yielding an effective slope of 2 Horizontal:1 Vertical. There will be shorter return tubes on the return ends to minimize flanking. Jute fabric will be placed on the upper bank face; and vegetation will be planted in the following spring. The Project will be installed at the toe of the bank parallel to Baxter Road from 91-105 Baxter Road (only the narrowest portion of 105 Baxter Road will be included), for an approximate length of just under 900 feet. The geotextile tubes will be covered with sand. The sand cover will be maintained and sacrificial sand will be added for protection and to ensure a minimum volume (equivalent to the annual volume contributed by the eroding coastal bank) is contributed annually. The Project is readily removable. Failure criteria and information related to protocols for and cost of removal are set forth in the October 25, 2013, November 5, 2013, and November 19, 2013 letters from Milone & MacBroom, submitted herewith.

II. THE COMMISSION'S VOTE

As stated above, the Initial Request and supporting material were submitted to the Commission on November 26, 2013 and the Commission met on November 27, 2013 to address the Initial Request. Mr. Steven Cohen, Esq., of Reade, Gullicksen, Hanley, Gifford & Cohen, LLP, appeared on behalf of SBPF. Six of the Commission's seven members were present.

The Commission voted 5-1 to deny the Initial Request and included in their motion to deny was the finding that the Initial Request did not satisfy three criteria: 1) no public agency ordering or performing the project, 2) not protecting public health or safety, and 3) proposal is more than necessary to abate the emergency.

III. GROUNDS FOR APPEAL

There can be no doubt that there is an emergency.

There can be no doubt that, to be performed effectively, the Emergency Project cannot await compliance with the notice requirements and appeal period associated with the filing of a notice of intent. As is established by the memos from Epsilon Associates dated November 1, 2013 and November 25, 2013 submitted herewith, the average long-term rate of retreat of the Bluff from 85-107A Baxter Road has been 4.6 feet/year, though erosion greater than or less than this rate can occur in a given year. Indeed, last year, in particular locations, the edge of the Bluff retreated landward as much as 40 feet, as presented in the memo from Epsilon Associates dated November 25, 2013. The Town of Nantucket had already concluded that "certain private homes located on or near Siasconset Bluff and Baxter Road, a public way, may be imminently

threatened with damage and/or loss and destruction due to severe erosion of the bluff which has intensified since the winter of 2012-2013… [and] an emergency exists that threatens public roads and other assets from imminent destruction" (Memorandum of Understanding between the Town of Nantucket and Sconset Beach Preservation Fund, Inc. entered into July 5, 2013, a copy of which is submitted herewith. Indeed, on October 9, 2013, in an amendment to the Memorandum of Understanding, the Town of Nantucket identified "an immediate need for emergency measures to protect Baxter Road and the associated utilities temporarily, in order to maintain vehicular access and utility service to the residential properties on Baxter Road… and there is an emergency need for an emergency response action plan outlining how the Town will provide emergency vehicular access, water supply and sanitary services to the residences at the north end of Baxter Road in the event of a failure of the roadway and that there is also a need for long-term planning for the potential eventual loss of Baxter Road…" (A copy of the Amendment to the Memorandum of Understanding is submitted herewith.) On November 8, 2013, the Town's consultant Milone & MacBroom, Inc. reported to the Director of the Department of Public Works after reviewing site conditions and conferring with Haley & Aldrich (which Milone & MacBroom identify as a well-respected geotechnical engineering firm that has been retained by SBPF) that "[t]he town can maintain travel on Baxter Road until such time as the top of the bluff is 25 feet or less from the edge of pavement. When the top of the bluff is within 25 feet of the pavement edge, the road should be closed to traffic until a detailed assessment can be completed by a geotechnical engineer." And, on November 20, 2013, the Town adopted an "Emergency Management and Marine Safety" Plan, a copy of which is submitted herewith. Nantucket's Wanacommet Water Company is mobilizing to move the water line from the east side of Baxter Road to the west side, at considerable expense, because it has determined that the east side is in immediate danger.

An analysis demonstrating the imminent risk to the roadway, utility and homes within the Emergency Project area is included in the memo from Epsilon Associates dated November 25, 2013 submitted herewith. As that analysis demonstrates, these assets are at risk of imminent loss in the current storm season.

The Chair of the Commission noted in the course of the proceedings on November 27, 2013 that Sconset Bluff has been eroding for 20,000 years and asked what was today's emergency? SBPF has been attempting to address the ongoing erosion of the bluff patiently and consistently for 20 of those years – the years during which it became clear that a devastating outcome would result from ignoring that erosion. These last 20 years should have provided a route to avoid the emergency the Town of Nantucket and the homeowners in the Emergency Project Area face today. We note that absence of an emergency was not cited as a ground for denial by the Commission, nor could it be.

There can be no doubt that the public health and safety is at risk and the Emergency Project is needed to protect it.

The long recitation included above of actions and declarations by public bodies and agencies should be enough to demonstrate the acknowledged risk to the public health and safety.

It is important to note that the proposed Emergency Project will simultaneously have multiple effects. It will protect Baxter Road, a public way, and the associated utilities, some or all of which constitute pre-1978 structures or infrastructure, and the residences on Baxter Road in the Emergency Project area, both seaward and landward of the road, all of which were constructed prior to 1978. Apart from direct danger to the structures themselves, loss of access to the residences by reason of the closure or failure of Baxter Road constitutes imminent danger to those pre-1978 residences. The pre-1978 status of the homes in the Emergency Project area is presented on Figure 11 (titled "Pre-1978 House Status") prepared by Epsilon Associates, submitted herewith. Accordingly, the Emergency Project is within the scope of work that "shall be permitted" under 310 CMR 10.30 The pre-1978 residential structures cannot be protected without protecting Baxter Road, and the public health and safety will thereby be directly addressed. Moreover, the beach below the bluff and specific means of access to it over the bluff are available to the public and the safety of the public use of these resources, including the stability of the bluff, is directly at stake. Finally, it is a mistake to suggest that because individual homes within a community are privately owned, the physical destruction of that community is not a threat to the public health and safety, just as it would be a mistake to say that the destruction of a community by fire, or storm or other natural disaster is not a public health and safety issue just because the individual structures destroyed may have been privately owned.

The Emergency Project is the minimum necessary to abate the emergency.

The proposed Emergency Project is necessary to abate the emergency, and is the minimum project necessary to abate the emergency both in terms of geographic scope and design. Other proposed mechanisms for protection of the Bluff have been mooted , which has provided an opportunity to vet alternatives. They range from the rock revetment which is the subject of SBPF's NOI DEP File No. 048-2581 to substituting less sturdy materials for the geotextiles which are proposed for the Emergency Project. As is shown in the letter from Milone & MacBroom dated November 1, 2013, submitted herewith, the use of jute bags in lieu of geotextiles will be inadequate to protect the roadway and utility infrastructure or the residences along Baxter Road. The principal problem is that, as was seen over time and especially in the course of last year, when multi-day storms or successive storms come close together there will not be adequate time to restore to the jute bags the sand which they give up during the earlier of the storms. The jute bags will fail (as shown on the photographs submitted herewith) and the bluff will be left unprotected during severe storms, multi-day storms, or successive storms, at the point when protection is most needed. Jute is inadequate for properties that no longer have enough room to survive a likely loss of the bluff, as here. The geotextiles proposed solved this problem and provide protection during the course of successive storms. The geotextile installation proposed for the Emergency Project is substantially different from previous geotextile installations permitted on Nantucket, as detailed in the memo from Epsilon Associates dated November 26, 2013, submitted herewith, and is not expected to generate significant debris, as presented in the correspondence from Dr. Michael Bruno dated November 25, 2013, submitted herewith.

In terms of the geographical scope of the Emergency Project, as the plans establish it is no wider that needed to protect the area identified as at imminent risk, and properly protect the flanks of the project and adjacent areas.

SBPF is an appropriate applicant for emergency certification.

The Commission found that the Initial Request did not comply with what it characterized as the criterion that a public agency order or perform the project. There is no such requirement. Nowhere in 310 CMR 10.06 does it say that a private party faced with immanent destruction of property that otherwise meets the criteria of that section cannot seek permission to perform emergency work or, if granted, perform that work. The regulation does, of course, tell a requesting party that it shall identify any public agency that is going to do the work or which has ordered that the work be done. But there is nothing in that language which would exclude a private party facing immanent destruction of property from filing to protect it. And indeed, DEP (then "DEQE") has taken the position, and relied upon it in the courts of the Commonwealth, that private persons can, in such situations, petition under 310 CMR § 10.06. In Wilson v Commonwealth, 31 Mass. App. Ct.757 (1992), owners of shorefront property in Chatham who had lost their homes when, as result of major storm activity in 1987, their homes were threatened. Without reciting the elaborate history, after litigation was underway, the homeowners in question filed a new NOI, and the conservation commission permitted them to build a revetment. DEP reversed that decision and some months later the homes were lost to the sea. In its reversal, DEP "advised the owners that they could still petition for emergency certification, see 310 Code Mass. Regs. § 10.06 (1987) to use nonpermanent structures (such as sand-filled tubes) to secure their property." Id. at p. 761, n.9. The court dismissed certain of the homeowners claims and allowed a regulatory takings claim to go forward.

In addition, we note that in the particular context of 310 CMR § 10.30, which provides that coastal engineering structures (which meet the identified criteria) 'shall be permitted' where necessary to protect pre-1978 structures such as are at risk here, to require private persons to suffer the complete destruction of the residences and physical loss of the earth that comprises their lots to the sea before granting a remedy runs afoul of basic principles of due process applicable under the state and federal constitutions. This is plainly an instance in which post-deprivation remedies are inadequate, and the owners are entitled to a hearing on the merits of their claims before their property is lost because of the time periods inherent in the NOI and administrative review processes.

Additional considerations.

Although we understand that emergency certification under the Nantucket Wetlands By-law is not within the review jurisdiction of DEP, the Agency could well be concerned from a practical point of view about the status of local certification. The local procedure, which appears at Chapter 136 section 5 of the Nantucket Town Code, mirrors 310 CMR § 10.06 in pertinent respects. The local language which would govern whether public agency action or direction is required mimics the language of the regulation and is no broader than that. The term 'emergency' is defined to incorporate a test of whether to be performed effectively the work can

await compliance with the notice requirements and appeal period associated with the filing of a notice of intent. The appeal period for review of a decision under the local certification period is governed by G.L. 259 section 4, and is 60 days; the procedure in such an action is governed by Superior Court Standing Order 1-96 and which provides that the Commission would have 90 days to file the record, and a 60 day briefing schedule thereafter, before the matter is ripe for hearing. This could not be accomplished in time to avert imminent danger during the current season.

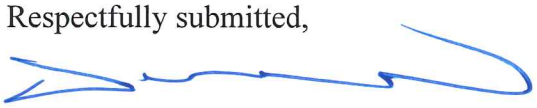
We note that although both the local procedure and that described in 310 CMR § 10.06, contemplate subsequent filing of an NOI, and therefore the evaluation is for that subsequent proceeding, SBPF submitted to the Commission (and submits herewith) a memo from Epsilon Associates dated November 26, 2013 presenting an analysis showing satisfaction of the relevant standards. But we also note that, although SBPF has in this request and in its previous projects, conformed to local Nantucket wetlands requirements, it has reserved its right to rely on the absence of municipal jurisdiction to regulate or impose more stringent requirements on work within the scope of the pre-1978 structures provisions of 310 CMR § 10.30. That section, uniquely among all the provisions of the Wetlands Protection Act Regulations, does not provide a floor above which municipalities may impose more stringent standards. That section appears to be the sole instance in the regulations in which it is stated that work (which meets the relevant criteria) "shall be permitted". That section, unlike the rest of the regulatory scheme, under principles of Home Rule and the analysis of Lovequist v. Conservation Commission of Dennis, 379 Mass. 7 (1979), DeGrace v. Conservation Commission of Harwich, 31 Mass. App. Ct. 132 (1991), and their progeny, occupies the field, and leaves no room for municipalities to strike a different balance between the competing interests at stake.

Finally, we note that the proposed Emergency Project can, under anticipated conditions, be completed in thirty days, and SBPF has an agreement in place with an experienced contractor to perform the work as soon as authorization is received.

IV. CONCLUSION

On the basis of the foregoing, SBPF respectfully requests that the DEP issue an emergency certification and grant permission for the Emergency Project.

Respectfully submitted,



David S. Weiss
Attorney for Siasconset Beach Preservation Fund, Inc.

DSW:vmm

Enclosures

- Request for Certification of Emergency: Sconset Bluff – Baxter Road of November 26, 2013
- Emergency Project Plans
- Memo from Epsilon Associates dated November 1, 2013
- Memo from Epsilon Associates dated November 25, 2013
- Two Memos from Epsilon Associates dated November 26, 2013
- Figure 11 (titled "Pre-1978 House Status") prepared by Epsilon Associates
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- Correspondence from Dr. Michael Bruno dated November 25, 2013
- Dr. Bruno's Resume

cc: Mr. David Johnston (Deputy Regional Director DEP SERO)
Ms. Elizabeth Kouloheras (Wetlands Section Chief DEP SERO)
Mr. James Mahala (Coastal Engineering DEP SERO)
Mr. Jeffrey Carlson (Conservation Agent)
Ms. Libby Gibson (Town Manager)
Ms. Kara Buzanoski (Director of DPW)
Mr. Robert DeCosta (Board of Selectmen)
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November 26, 2013

Mr. Ernie Steinauer, Chair
Nantucket Conservation Commission
Town of Nantucket
16 Broad Street
Nantucket, MA 02554

Re: Request for Certification of Emergency: Sconset Bluff – Baxter Road

Dear Chairman Steinauer:

This firm, together with Messrs. Reade and Cohen of Reade, Gullicksen, Hanley, Gifford & Cohen, LLP, is counsel to Siasconset Beach Preservation Fund, Inc. ("SBPF"). This letter constitutes a request for permission to perform an emergency project, and for certification that the project is an emergency under 310 CMR 10.06 and §136-5 of the Nantucket Town Code.

The work that is proposed (the "Emergency Project") is required in response to the ongoing erosion of Sconset Bluff (sometimes called "Siasconset Bluff") which has reached the point of posing an immediate threat in the current storm season to Baxter Road, a public way, and associated utilities as well as the homes seaward and landward of Baxter Road in the "Emergency Project Area" shown on the project plans submitted herewith. Because significant analysis has been done in connection with two distinct notices of intent (Baxter Road Temporary Stabilization Project, DEP File No. 048-2610 and Baxter Road and Sconset Bluff Storm Damage Prevention Project, DEP File No. 048-2581), both of which are presently pending before the Commission, we are able to present more complete information than is sometimes the case with respect to a request for emergency certification.

The Emergency Project is proposed for 91-105 Baxter Road in accordance with the emergency criteria set forth in the memo from Epsilon Associates dated November 25, 2013, submitted herewith. Other than the proposed reduction in length of coverage, the Emergency Project is similar to the Baxter Road Temporary Stabilization Project (DEP File No. 048-2610) for 85-107A Baxter Road described in detail in the letters and plans submitted during the NOI process by Milone & MacBroom dated October 25, 2013, November 1, 2013, November 5, 2013, and November 19, 2013, submitted herewith. In overview, the Emergency Project involves the installation of four 45-foot circumference geotextile tubes, which are approximately 19 wide, 6.5 feet tall, and 100-200 feet long. The bottom tube will be buried in the beach to elevation 0.0 MLW and the top tube will be set at elevation 26.0 MLW. A scour apron and four-foot-diameter anchor tube are included, extending five feet seaward of the lowest geotextile tube

at elevation 0.0 MLW. The four geotubes will overlap by approximately 1/3 of their circumference, yielding an effective slope of 2 Horizontal:1 Vertical. There will be shorter return tubes on the return ends to minimize flanking. Jute fabric will be placed on the upper bank face; and vegetation will be planted in the following spring. The Project will be installed at the toe of the bank parallel to Baxter Road from 91-105 Baxter Road (only the narrowest portion of 105 Baxter Road will be included), for an approximate length of just under 900 feet. The geotextile tubes will be covered with sand. The sand cover will be maintained and sacrificial sand will be added for protection and to ensure a minimum volume (equivalent to the annual volume contributed by the eroding coastal bank) is contributed annually. The Project is readily removable. Failure criteria and information related to protocols for and cost of removal are set forth in the October 25, 2013, November 5, 2013, and November 19, 2013 letters from Milone & MacBroom, submitted herewith.

There can be no doubt that because of the conditions giving rise to the emergency, to be performed effectively, the Emergency Project cannot await compliance with the notice requirements and appeal period associated with the filing of a notice of intent. As is established by the memos from Epsilon Associates dated November 1, 2013 and November 25, 2013 submitted herewith, the average long-term rate of retreat of the Bluff from 85-107A Baxter Road has been 4.6 feet/year, though erosion greater than or less than this rate can occur in a given year. Indeed, last year, in particular locations, the edge of the Bluff retreated landward as much as 40 feet, as presented in the memo from Epsilon Associates dated November 25, 2013. The Town of Nantucket had already concluded that "certain private homes located on or near Siasconset Bluff and Baxter Road, a public way, may be imminently threatened with damage and/or loss and destruction due to severe erosion of the bluff which has intensified since the winter of 2012-2013… [and] an emergency exists that threatens public roads and other assets from imminent destruction" (Memorandum of Understanding between the Town of Nantucket and Sconset Beach Preservation Fund, Inc. entered into July 5, 2013, a copy of which is submitted herewith. Indeed, on October 9, 2013, in an amendment to the Memorandum of Understanding, the Town of Nantucket identified "an immediate need for emergency measures to protect Baxter Road and the associated utilities temporarily, in order to maintain vehicular access and utility service to the residential properties on Baxter Road… and there is an emergency need for an emergency response action plan outlining how the Town will provide emergency vehicular access, water supply and sanitary services to the residences at the north end of Baxter Road in the event of a failure of the roadway and that there is also a need for long-term planning for the potential eventual loss of Baxter Road…" (A copy of the Amendment to the Memorandum of Understanding is submitted herewith.) On November 8, 2013, the Town's consultant Milone & MacBroom, Inc. reported to the Director of the Department of Public Works after reviewing site conditions and conferring with Haley & Aldrich (which Milone & MacBroom identify as a well-respected geotechnical engineering firm that has been retained by SBPF) that "[t]he town can maintain travel on Baxter Road until such time as the top of the bluff is 25 feet or less from the edge of pavement. When the top of the bluff is within 25 feet of the pavement edge, the road should be closed to traffic until a detailed assessment can be completed by a geotechnical engineer." And, on November 20, 2013, the Town adopted an "Emergency Management and Marine Safety" Plan, a copy of which is submitted herewith. Nantucket's Wanacommet Water

Company is mobilizing to move the water line from the east side of Baxter Road to the west side, at considerable expense, because it has determined that the east side is in immediate danger.

An analysis demonstrating the imminent risk to the roadway, utility and homes within the Emergency Project area is included in the memo from Epsilon Associates dated November 25, 2013 submitted herewith. As that analysis demonstrates, these assets are at risk of imminent loss in the current storm season. The proposed Emergency Project can, under anticipated conditions, be completed in thirty days, and SBPF as an agreement with an experienced contractor to perform the work as soon as authorization is received.

The proposed Emergency Project will simultaneously have two effects. It will protect Baxter Road, a public way, and the associated utilities, some or all of which constitute pre-1978 structures or infrastructure, and the residences on Baxter Road in the Emergency Project area, both seaward and landward of the road, all of which were constructed prior to 1978. Apart from direct danger to the structures themselves, loss of access to the residences by reason of the closure or failure of Baxter Road constitutes imminent danger to those pre-1978 residences. The pre-1978 status of the homes in the Emergency Project area is presented on Figure 11 (titled "Pre-1978 House Status") prepared by Epsilon Associates, submitted herewith. Accordingly, the Emergency Project is within the scope of work that "shall be permitted" under 310 CMR 10.30 and within the scope of parallel provisions of the Nantucket Wetlands Regulations.[1]

The proposed Emergency Project is necessary to abate the emergency. Other proposed mechanisms for protection of the Bluff have been mooted. They range from the rock revetment which is the subject of SBPF's NOI DEP File No. 048-2581 to substituting less sturdy materials for the geotextiles which are proposed for the Emergency Project. As is shown in the letter from Milone & MacBroom dated November 1, 2013, submitted herewith, the use of jute bags in lieu of geotextiles will be inadequate to protect the roadway and utility infrastructure or the residences along Baxter Road. The principal problem is that, as was seen over time and especially in the course of last year, when multi-day storms or successive storms come close together there will not be adequate time to restore to the jute bags the sand which they give up during the earlier of the storms. The jute bags will fail (as shown on the photographs submitted herewith) and the bluff will be left unprotected during severe storms, multi-day storms, or successive storms, at the point when protection is most needed. Jute is inadequate for properties that no longer have enough room to survive a likely loss of the bluff, as here. The geotextiles proposed solved this problem and provide protection during the course of successive storms. The geotextile installation proposed for the Emergency Project is substantially different from

[1] We note the "20% change" language incorporated into certain aspects of the portions of the Nantucket Wetlands Regulations which address pre-1978 structures. That language does not of course apply to infrastructure. Nothing in this request is, or is intended to be, a waiver, admission, or acknowledgment adversely affecting any claim or argument available to SBPF that a municipality has jurisdiction or authority to impose more stringent limitations on projects that "shall be permitted" under the Wetlands Protection Act Regulations than those provided for in those Regulations. SBPF expressly reserves all of its rights with respect thereto.

previous geotextile installations permitted on Nantucket, as detailed in the memo from Epsilon Associates dated November 26, 2013, submitted herewith, and is not expected to generate significant debris, as presented in the correspondence from Dr. Michael Bruno dated November 25, 2013, submitted herewith.

As a result of the substantial analysis that has been undertaken in connection with the pending Notices of Intent, sufficient information has been developed so that the proposed Emergency Project minimizes, mitigates, and provides monitoring protocols for any perceived impacts on third-parties, as is more fully set forth in the memos from Milone & MacBroom dated November 1, 2013, November 12, 2013, and November 19, 2013; the memo from Epsilon Associates dated November 1, 2013; and the correspondence from Dr. Michael Bruno dated November 25, 2013, submitted herewith. The harm that will result from failing to certify that emergency and permit the Emergency Project to go forward together with the potential for removal of the Proposed Project should that prove necessary, far outweighs any risks thought to be associated with the proposed work.

We note that the Regulations contemplate action by the Commission within twenty-four hours of a request for emergency certification (310 CMR 10.6(5)), and in the event the Commission does not act within that period of time the request may be brought to the Department of Environmental Protection for action by it in lieu of the Commission. The Regulations also contemplate that an NOI is to be filed after any emergency certification, in the course of which compliance with performance standards will be evaluated. Although that evaluation is for that subsequent proceeding, submitted herewith is a second memo from Epsilon Associates dated November 26, 2013 presenting an analysis showing satisfaction of the relevant standards.

We are prepared to work with you to facilitate a response to this request as expeditiously as possible.

Respectfully submitted,

David S. Weiss

DSW:vmm
Enclosures

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Ms. Kara Buzanoski (Director of DPW)
Mr. Robert DeCosta (Board of Selectmen)
Mr. David Johnston (Deputy Regional Director DEP SERO)

SBPF
Messrs. A Reade and S. Cohen, Esqs.
Epsilon Associates

GSDOCS\2287039.2

Michael S. Bruno, ScD, PE, F. ASCE

Charles V. Schaefer School of Engineering and Science
Stevens Institute of Technology
Hoboken, NJ 07030
(201)216-5338 mbruno@stevens.edu

Professional Experience

Stevens Institute of Technology *August 1989 to present*

Dean, School of Engineering and Science (2007 to present)

Responsible for strategic planning, operations, budget, faculty hiring and mentoring, external relations, assessment and accreditation.

Director, DHS National Center of Excellence in Port Security (2008 to present)

Director, Center for Maritime Systems and the Davidson Laboratory (1989 to 2007)

Responsible for strategic planning, technical direction, budgeting, business development, human resources and quality assurance; annual budget of approximately $10 million. Scientific staff of more than 50.

Professor, Department of Civil, Environmental and Ocean Engineering (1989 to present)

Director, Stevens Scholars Program; Coordinator, Ocean Engineering Program,

Director, New Jersey Coastal Protection Technical Assistance Service (1992 to 2007)

Responsible for all aspects of the Service, which provides technical advice to State and local government officials on matters related to shore protection, as well as public outreach and education pertaining to coastal processes, weather/climate issues, and water quality issues.

New Jersey Institute of Technology *August 1986 to July 1989*

Assistant Professor

Massachusetts Institute of Technology *June 1982 to July 1986*

Cambridge, Massachusetts

Research Assistant

State of New Jersey *August 1981 to June 1982*

Department of Environmental Protection

Principal Engineer

Education

Massachusetts Institute of Technology/ Woods Hole Oceanographic Institution *1982 - 1986*

Cambridge, Massachusetts

Doctor of Science - 1986 - Oceanographic Engineering

University of California at Berkeley *1980 - 1981*

Berkeley, California

Master of Science - 1981 – Civil Engineering

New Jersey Institute of Technology *1976 - 1980*

Newark, New Jersey

Bachelor of Science - 1980 – Civil Engineering

Professional Activities/Accomplishments

Member, **Naval Research Advisory Committee** (2009-present)

Member, **Ocean Research Advisory Panel** (2010-present)

Chair, **Marine Board of the National Research Council** (2005-2012)

Visiting Professor, Dept of Mechanical Engineering, **University of London** (2004-present)

Secretary General, Pan American Federation of Coastal and Ocean Engineers (1990-present)

Editor-in-Chief, Journal of Marine Environmental Engineering (1993-present)

Chair, Workshop Committee, **Group on Earth Observations** Coastal Zone Community of Practice, "Observing System Support for Decision-Making in the Coastal Zone: Managing and Mitigating the Impacts of Human Activities and Natural Hazards in the Coastal Zone" (2006-present)

Member, Board of Directors, **Mid-Atlantic Regional Association Coastal Ocean Observing System** (2008-present)

Member, **Transportation Research Board** Committee on Marine Environment (2006-2010)

Member, **American Meteorological Society** Committee on Coastal Environment (2007–2012)

Member, **Defense Science Board** Summer Study on Homeland Security (2003-2004)

Member, Board of Trustees, New Jersey Marine Sciences Consortium (2006–2012)

Member, **National Research Council** Committee on Oil Spill Countermeasures (1995-1997)

Registrations

Registered Professional Engineer in State of New Jersey

SCUBA Instructor (PADI and NAUI)

Awards

Denny Medal, 2007, The Institute of Marine Engineering, Science & Technology, London.
Fellow, ASCE, 2006
President's Leadership Award, 2006, Stevens Institute of Technology
Fulbright Scholar, 1996 (appointment at Aristotle University of Thessaloniki, Greece)
Office of Naval Research Young Investigator Award, 1991
Outstanding Service Award, American Society of Civil Engineers, 1988
Fellow, Explorers Club, 2002
Member, Cosmos Club, 2003
James Robbins Award for excellence in teaching, N.J. Inst. of Tech. 1986 – 1987
Honorary Member, Mexican Academy of Sciences

Patents

M. Bruno, A. Sutin, 5 others, "Passive Acoustic Underwater Intruder Detection System", April, 2012.

Publications

Books

1. Wilkens, R., T. Gemelas, and M. Bruno (co-editors). 2011. "Maritime Domain Awareness and Resilience Applications for Homeland Security'. J. Marine Technology Society, Vol. 45, No 3.

2. Bruno, M.S. and R.I. Hires, 2006. "Oceanography", Encyclopedia of Environmental Science and Engineering, Fifth Edition, 790-801, Taylor and Francis.

3. Bruno, M.S. (2005). "Physical Models", in Encyclopedia of Coastal Science. M. L. Schwartz ed., 769-771. Springer.

4. Bruno, M.S. 2001. "Physical Modeling", in Encyclopedia of Coastal Science, M. Schwartz, ed., Kluwer.

5. Englehardt, R. and Bruno, M.S. (co-editors). 1998. Oil Spill Countermeasures. International Union of Pure and Applied Chemistry, Research Triangle Park, North Carolina.

6. Bruno, M.S., 1992. "Oceanography", Encyclopedia of Environmental Sciences and Engineering, Third Edition, 801-812, Gordon and Breach.

Refereed Publications

1. Rogowski, P., R. Stolkin, and M. Bruno. 2012. "Optimization of the Spatial Distribution of Oceanographic Sensors in a Highly Variable Estuarine Environment", J. Marine Environmental Engrg. Vol. 9, No 3, 211-224.

2. M. S. Bruno, A. Sutin, K. W. Chung, A. Sedunov, N. Sedunov, H. Salloum, H. Graber, and P. Mallas. 2011. "Satellite Imaging and Passive Acoustics in Layered Approach for Small Boat Detection and Classification", J. Marine Technology Society, Vol. 45, No 3, 77-87.

3. K.W. Chung, A. Sutin, A. Sedunov, and M. Bruno. 2011. "DEMON Acoustic Ship Signature Measurements in an Urban Harbor," Advances in Acoustics and Vibration, vol. 2011, 13 pages.

4. K.W. Chung, A. Sutin, A. Sedunov, and M. Bruno. 2011. "Cross-correlation method for measuring ship acoustic signatures", Proceedings, 160th Meeting Acoustical Society of America, 11, 1-12.

5. R. Messaros and M.S. Bruno. 2011. "A Laboratory Investigation of Bedform Geometry under Regular and Irregular Surface Gravity Waves", Journal of Coastal Research.

6. A. Sutin, B. Bunin, A. Sedunov, N. Sedunov, M. Tsionsky, M. Bruno. 2010. "Stevens Passive Acoustic System for Underwater Surveillance", Proceedings, Waterside Security Conference.

7. M.S. Bruno, K.W. Chung, H. Graber, A. Sutin, P. Mallas, H. Salloum, A. Sedunov, N. Sedunov. 2010. "Concurrent Use of Satellite Imaging and Passive Acoustics for Maritime Domain Awareness", Proceedings, Waterside Security Conference.

8. B. Bunin, A. Sutin, M. Bruno. 2007. "Maritime Security Laboratory for Maritime Security Research", Optics and Photonics in Global Homeland Security, Proc, SPIE, Vol 6540, 1-8.

9. Bruno, M.S., A.F. Blumberg and T.O. Herrington. 2006. The Urban Ocean Observatory - Coastal Ocean Observations and Forecasting in the New York Bight. Journal of Marine Science and Environment, No C4, IMarEST, 1-9.

10. Roarty, H and M.S. Bruno. 2006. "Laboratory Measurements of Bed Load Sediment Transport Dynamics", *ASCE Journal of Waterway, Port, Coastal, & Ocean Engineering.* Vol 132, No 3, 199-211.

11. Fan, S., A F. Blumberg, M. S. Bruno, D. Kruger, and B. Fullerton. 2006. The Skill of an Urban Ocean Forecast System, Estuarine and Coastal Modeling, ASCE, 720- 731.

12. Bruno, M.S., B. J. Fullerton, R. Datla, and P. Rogowski. (2004). "Field and Laboratory Investigation of High-Speed Ferry Wake Impacts in New York Harbor", High Speed Performance Vehicles, 277-286. Springer.

13. Bruno, M.S. and A.F. Blumberg. 2004. "An Ocean Observatory for the Maritime Community – Real-time Assessments and Forecasts of the New York Harbor Marine Environment", Sea Technology, August. Compass Publications.

14. Rankin, K.L., M.S. Bruno, and T.O. Herrington. (2004). "Nearshore Currents and Sediment Transport Measured at Notched Groins", *J. Coastal Res., No 33, 237-254.*

15. Rankin, K.L., T.O. Herrington, M.S. Bruno, P. B. Burke, and A.M. Pence. (2004). "Cross-shore Distribution of Alongshore Currents and Sediment Fluxes in the Vicinity of Notched Groins", *J. Coastal Res., No 33, 255-268.*

16. Bruno, M.S., K.L. Rankin, T.O. Herrington, and N. Kraus. 2002. "Re-engineering Existing Coastal Structures: Guidelines and Impacts", *Coastlines, Structures and Breakwaters*, Institute of Civil Engineers, London.

17. Nordstrom, K.F., N.L. Jackson, M.S. Bruno, and H.A. deButts. 2001. "Municipal Initiatives for Managing Dunes in Coastal Residential Areas", *Geomorphology*.

18. Bruno, M.S., O. G. Nwogu, K.L. Rankin, and T. O. Herrington, 2001. "Real-Time Coastal Monitoring and Forecasting System : Preliminary Results", *International Conference on Coastal Engineering*, Vol 1, 283-291, ASCE.

19. Herrington, T.O., M S. Bruno, and K. L. Rankin. 2000. "The New Jersey Coastal Monitoring Network: A Real-Time Coastal Observation System", *Journal of Marine Environmental Engineering,* 6, 1, 69-82, Gordon and Breach.

20. Jackson, N.L., K.F. Nordstrom, M.S. Bruno, and V.L. Spaulding, 2000. "Classification of Spatial and Temporal Changes to a Developed Barrier Island", in *Geomorphology, Human Activity and Global Environmental Change,* 269-283, O. Slaymaker Ed, John Wiley & Sons.

21. Bruno, M.S., K.L. Rankin, and T.O. Herrington. 1999. Coastal Wave Measurement and Forecast System : Preliminary Results and Model Selection, *Estuarine and Coastal Modeling,* 899-914. ASCE.

22. Roarty, H. J. and M.S. Bruno, 1999. "Measurement of Suspended Sediment Concentration in the Laboratory through Photographic Techniques", *Coastal Sediments*, Volume 1, 163-178, ASCE.

23. Cadmus, K. A. and M.S. Bruno, 1999. "Influence of Tidal Water Surface Fluctuations on Beach Profile Evolution", *Coastal Sediments*, Volume 1, 437-446, ASCE.

24. Herrington, T.O., Rankin, K.L., and M.S. Bruno, 1999. "Design and Implementation of a Real-Time Coastal Monitoring Network", *Proceedings, 1999 National Conference on Beach Preservation Technology*, St. Petersburg, Florida, 95-111.

25. Bruno, M.S., M. Yavary, and T.O. Herrington, 1998. "The Influence of a Stabilized Inlet on Adjacent Shorelines: Manasquan, New Jersey", *Shore & Beach*, Vol. 66, No. 2, 19-25.

26. Herrington, T.O., M. S. Bruno, M. Yavary, and K. L. Rankin, 1998. "Nearshore Coastal Processes Adjacent to a Tidal Inlet", *International Conference on Coastal Engineering*, Volume 3, 3331-3344, ASCE.

27. Rankin, K.L., M.S. Bruno, and R. I. Hires, 1998. "Development and Implementation of a Shear Plate for the Direct Measurement of Bottom Shear Stress in Moveable Bed Environments", *International Conference on Coastal Engineering*, Volume 3, 2628-2639, ASCE.

28. Herrington, T.O., and M.S. Bruno, 1998. "Observations of Structure Induced Scour Adjacent to Submerged Narrow - Crested Breakwaters", *Coastlines, Structures and Breakwaters*, Institution of Civil Engineers, 106-118.

29. Herrington, T.O., and M.S. Bruno, 1998. "Determination of the Relative Magnitudes of Nearshore Physical Forcing Terms for use in Hydrodynamic Models which Utilize Inverse Methods, *Estuarine and Coastal Modeling*, ASCE.

30. Bruno, M.S., Herrington, T.O., Rankin, K.L. and K.E. Ketteridge, 1997. "Artificial Reefs and Other Emerging Technologies: Prospects for Success", *Proceedings, Coastal Zone 97*, Boston.

31. Bruno, M.S. and R.L. Van Dyck, 1997. "Experimental Study of Containment Boom Behavior in Waves", *J. Marine Technology*, Vol. 34, 24-30, SNAME.

32. Bruno, M.S., T.O. Herrington, and K.L. Rankin, 1996. "The Use of Artificial Reefs in Erosion Control: Results of the New Jersey Pilot Reef Project", *Proceedings*, *Ninth Conference on Beach Preservation Technology*, St. Petersburg, Fla. January 25, 1996, 239-254.

33. Waters, J.K. and M.S. Bruno, 1995. "Internal Wave Generation by Ice Floes Moving in Stratified Water: Results from a Laboratory Study", *J. Geophysical Research*, 100, 13635-13639.

34. Ahsan, A.K.M., Bruno, M.S., Oey, L.Y., and R.I. Hires, 1994. "Wind-Driven Dispersion in New Jersey Coastal Waters", *Journal of Hydraulics*, Vol. 120, 1264-1273, ASCE.

35. Bruno, M.S., 1993. "Laboratory Testing of an Artificial Reef Erosion Control Device", *Proceedings, Coastal Zone*, Vol. 2, 2147-2158, ASCE.

36. Cho, W.C. and M.S. Bruno, 1992. "Breaking Wave Generation in the Laboratory", *J. Korean Society of Coastal and Ocean Engineers*, Vol. 4, 178-186.

37.Bruno, M.S., 1992. "Laboratory Study of an Artificial Reef Beach Erosion Control Device", *Trans. Pan American Federation of Coastal and Ocean Engineers*.

38. Bruno, M.S., 1992. "Quantifying Sea Ice Drag through Laboratory Experiments", *Proceedings, Eleventh Intl. Conf. on Offshore Mechanics and Arctic Engineering*, 5-10, ASME.

39. Ahsan, A.K.M. and M.S. Bruno, 1992. "A Three-Dimensional Eulerian-Lagrangian Transport Model", *Estuarine and Coastal Modeling*, 1-12, ASCE.

40. Bruno, M.S., 1991. "The Effect of Internal Waves on Sea Ice Drift", Proceedings, *Tenth Intl. Conf. on Offshore Mechanics and Arctic Engineering*, 137-141, ASME.

41. Martin, J.P., J.R. Weggel, M.S. Bruno, and S. Halsey, 1991. "The Use of High Fly Ash Concrete for Marine Structures", *Trans. American Coal Ash Association*, Washington,DC, 54, 1-15.

42. Bruno, M.S., 1991. "A Note on the Determination of Sea Ice Concentration", *J. Offshore Mech. and Arctic Engineering.*, 113, 88-90, ASME.

43. Bruno, M.S., 1991. "Beach Erosion - Shoreline Evolution Modeling: A Case Study", *Proceedings, Pan American Federation of Engineering Societies*, Washington, D.C., 213-221, ASCE.

44. Bruno, M.S., M. Muntisov, and H.B. Fischer, 1990. "The Effect of Buoyancy on Transverse Mixing in Streams", *Journal of Hydraulics*, 116, 1484-1494, ASCE.

45. Bruno, M.S., 1990. "Field Measurements of Ice Drag Coefficients", *Proceedings, Ninth Intl. Conference on Offshore Mechanics and Arctic Engineering.*, ASME, 155-159.

46. Ahsan, A.K.M. and M.S. Bruno, 1989. "Three-Dimensional Modeling of Pollutant Transport in Coastal Waters", *Estuarine and Coastal Modeling*, 462-471, ASCE.

47. Bruno, M.S., 1989. "An Eulerian-Lagrangian Model for the Prediction of Ice Hazards in Shallow Waters", *Proceedings, Eighth Intl. Conference on Offshore Mechanics and Arctic Engineering*, The Hague, The Netherlands, Vol. 4, 229-234, ASME.

48. Bruno, M.S., O.S. Madsen, 1989. "Coupled Circulation and Ice Floe Movement Model for Partially Ice-Covered Continental Shelves", *J. Geophysical Research*, 94, 2065-2078.

49. Madsen, O.S., and M.S. Bruno, 1987. "A Methodology for the Determination of Drag Coefficients for Ice Floes", *J. Offshore Mech. and Arctic Engineering*, 109, 381-387, ASME.

50. Madsen, O.S., and M.S. Bruno, 1986. "A Methodology for the Determination of Drag Coefficients for Ice Floes", *Proceedings, Fifth Intl. Conference on Offshore Mechanics and Arctic Engineering*, Tokyo, Vol. 4, 410-417, ASME.

Other Major Publications

1. Lindstrom, E., R. Spinrad, Z. Willis, D. Martin, D. Hernandez, C. Wilson, H. Seim, M. Bruno, D. Legler, B. Hauptman. 2013. U.S. Integrated Ocean Observing System (IOOS) 2012 Summit Report. 96 pp.

2. Bruno, M.S. et. al. 2012. Marine Corps Capabilities for Countering Precision Weapon Threats. Naval Research Advisory Committee Report. 52 pp.

3. Bruno, M.S. 2011. Center for Secure and Resilient Maritime Commerce, Year 3 Report. Department of Homeland Security, Office of University Programs, Science and Technology Directorate. 221 pp.

4. Bruno, M.S. 2010. Center for Secure and Resilient Maritime Commerce, Year 2 Report. Department of Homeland Security, Office of University Programs, Science and Technology Directorate. 173 pp.

5. Sommerer, J. et. al. 2010. Status and Future of the Naval R&D Establishment. Naval Research Advisory Committee Report. 139 pp.

6. Bruno, M.S. 2009. Center for Secure and Resilient Maritime Commerce, Year 1 Report. Department of Homeland Security, Office of University Programs, Science and Technology Directorate. 128 pp.

7. Rankin, K.L. and M.S. Bruno. 2005. Wave Transformation and Nearshore Currents in the Vicinity of a Wide-Crested Submerged Reef. Proceedings, National Conference on Beach Preservation Technology, Destin, Florida.

8. Greig, A., M.S. Bruno and J.L. Waters. 2004. "Comparison of Naval Architecture Programs at U.K. and U.S. Institutions. Proceedings, ASEE Conference, June 21, 2004.

9. Bruno, M.S., Fullerton, B. and R. Datla. 2004. "Results of the New York Harbor High-Speed Ferry Wake Project." Proceedings, National Harbor Operations Committee Conference, Ft. Lauderdale, February 24, 2004.

10. Bruno, M.S., Herrington, T.O., and K.L. Rankin. 2001. Coastal Engineering Analysis of the Atlantic Ocean Shoreline of the Village of Ocean Beach, County of Suffolk, New York, prepared for the Village of Ocean Beach, N.Y.

11. Kaluarachchi, I.D., M.S. Bruno, Q. Ahsan, A.F. Blumberg, and H. Li. 2003. "Estimating the Volume and Salt Fluxes through the Arthur Kill and the Kill van Kull." World Water & Environmental Resources Congress, ASCE.

12. Bruno, M.S. 2003. "The New York Harbor Observation System." Proceedings, National Harbor Operations Committee Conference, New York, April 7, 2003.

13. Bruno, M.S., B. Fullerton, and R. Datla. 2002. "Ferry Wake Wash in New York Harbor." Report prepared for New Jersey Department of Transportation. Report SIT-DL-02-9-2812, October, 2002.

14. Herrington, T.O., K.L. Rankin, and M.S. Bruno. 2002. "The New Jersey Coastal Monitoring Network." New Jersey Sea Grant Extension Program Bulletin, No. 15.

15. Bruno, M.S., K.L. Rankin, F. McDonough, and R. Chant. 2001. "Monitoring of Hydrodynamics, Sediment Transport, and Water Quality in the Port of New York/ New Jersey." Proceedings, Marine Transportation System Research and Technology Coordination Conference, Washington, D.C., November 14-16, 2001.

16. Allee, King, Rosen & Fleming Inc., Moffatt & Nichol, Engineers, and M.S. Bruno. 2000. Town of Southampton Atlantic Ocean Shoreline, Draft Generic Environmental Impact Statement, prepared for Town of Southampton, New York.

17. Bruno, M.S., Herrington, T.O. and K.L. Rankin. 1999. Coastal Engineering Analysis of the Shoreline of the Village of Ocean Beach, Fire Island, New York, prepared for the Village of Ocean Beach, N.Y.

18. Bruno, M.S. and K.L. Rankin, 1999. "Application of Simple Shoreline Evolution Concepts : Analysis of A Dynamic Coastline". *Proceedings, Coastal Ocean Processes Symposium, Woods Hole Oceanographic Institution.*

19. Herrington, T.O., M.S. Bruno, and R.I. Hires. 1998. Newport Marine Terminal, Hydrodynamic and Sedimentation Analysis of Long Wharf, prepared for Louis Berger & Associates, Inc.

20. Bruno, M.S., Rankin, K.L., and T.O. Herrington, 1998. "Natural and Anthropogenic Factors Influencing Shoreline Change", *Proceeedings, Marine Technology Society*, Baltimore.
Bruno, M.S., 1998. "Technological Improvements and Beachfill Design : Coastal Engineering in the Information Age", *Proceedings, American Littoral Society Meeting*, Sandy Hook, New Jersey.

21. Herrington, T.O., M.S. Bruno, and K.E. Ketteridge, 1997. "Monitoring Study of the Beachsaver Reef at Cape May Point, New Jersey", Report SIT-DL-96-9-2751, submitted to the Borough of Cape May Point, N.J., Stevens Institute of Technology.

22. Bruno, M.S. 1996. "Ocean Engineering Research Activities in the Country of Greece", report prepared for the Office of Naval Research, Europe, London.

23. Bruno, M.S. 1996. "Field Investigation and Sediment Transport Analysis of the Manasquan, New Jersey Shoreline", Report SIT-DL-9-96-2740, submitted to U.S. Army Corps of Engineers, Stevens Institute of Technology.

24. Bruno, M.S., T.O. Herrington, K.L. Rankin, and K.E. Ketteridge, 1996. "Monitoring Study of the Beachsaver Reef at Avalon, New Jersey, Report SIT-DL-9-96-2739, submitted to the Borough of Avalon, N.J., Stevens Institute of Technology.

25. Bruno, M.S. 1996. "Laboratory Study of the Dispersion Characteristics of Orimulsion", Report SIT-DL-95-9-2734, submitted to Roy F. Weston, Inc., Stevens Institute of Technology.

26. Bruno, M.S. 1995. "Future Prospects for Erosion Control Technology", Marine and Estuarine Shallow Water Science and Management Conference, abstract published April 3, 1995, USEPA.

27. Bruno, M.S. and R.B. Abel, 1995. "Engineering New Jersey's Shoreline", *Proceedings, International Symposium on Coastal Ocean Space Utilization*, Yokohama, Japan, National Science Foundation.

28. Van Dyck, R.L., and M.S. Bruno, 1995. "Effect of Waves on Containment Boom Response, *Proceedings, International Oil Spill Conference*, San Diego.

29. Bruno, M.S. and R. Datla, 1995. "Scale Model Test of the Demi-Tek Rotating Reef Erosion Control Device", Report SIT-DL-95-9-2720, submitted to Demi-Tek, Inc., Stevens Institute of Technology.

30. Bruno, M.S. 1994. "Results of Shoreline Monitoring Program, Manasquan, New Jersey", Report SIT-DL-95-9-2717, submitted to the Borough of Manasquan, New Jersey, Stevens Institute of Technology.

31. Bruno, M.S., 1994. "Physical Model Study of MOTO Wave Energy Extraction System", Report SIT-DL-94-9-2710, submitted to Greenworld Group, New York, N.Y., Stevens Institute of Technology.

32. Bruno, M.S. and T.O. Herrington, 1994, "Monitoring Study of the Beachsaver Reef at Avalon, New Jersey", Report SIT-DL-94-9-2709, submitted to the Borough of Avalon, New Jersey, Stevens Institute of Technology.

33. Waters, J.K., Bruno, M.S., Herrington, T.O., and K.L. Rankin, 1993. "A Laboratory Investigation of Sea Ice Dynamics in a Stratified Waterbody", Report SIT-DL-93-9-2695, submitted to Office of Naval Research, Stevens Institute of Technology.

34. Bruno, M.S., 1992. "Three-Dimensional Modeling of Pollutant Transport in Surface Waters", Report SIT-DL-92-9-2680, submitted to U.S. Geological Survey, Stevens Institute of Technology.

35. Bruno, M.S., T.G. McKee, and W.M. Clark, 1992. "Laboratory Study of an Artificial Reef Beach Erosion Mitigation Device", Report SIT-DL-92-9-2676, Stevens Institute of Technology.

36. Bruno, M.S., 1992. "Beach Erosion and Retaining Wall Deterioration at Spring Lake and Belmar, New Jersey, Report SIT-DL-91-11-2667, Stevens Institute of Technology.

37. Bruno, M.S., 1991. "Modeling-State of the Art", in Proceedings, Southern New Jersey Coastal Modeling Workshop, U.S. Army Corps of Engineers.

38. Bruno, M.S., McKee, T.G. and R.I. Hires, 1991. "Combined Hydraulic - Water Quality Model for the Arthur Kill Waterway, Report submitted to New York City Dept. of Sanitation.

39. Bruno, M.S., S. Leatherman and H. Bokuniewicz, 1991. "Sand Transport at the East Hampton Groins". Marine Sciences Research Center, SUNY Stony Brook.

40. Bruno, M.S. and T.O. Herrington, 1990. "Concrete Artificial Reefs and the Potential for Coal Fly Ash Utilization". Report SIT-DL-90-9-2652, Stevens Institute of Technology.

41. Bruno, M.S., 1989. "An Eulerian-Lagrangian Model for the Prediction of Ice Hazards in Shallow Coastal Waters". Report SIT-DL-89-9-2640 submitted to National Science Foundation, Stevens Institute of Technology.

42. Bruno, M.S., 1988. "The Feasibility of Sand-Bypassing for the Alleviation of Beach Erosion at Manasquan and Shark River, New Jersey", report prepared for the New Jersey Department of Environmental Protection, Division of Coastal Resources, New Jersey Institute of Technology.

43. Bruno, M.S., 1986. "A Coupled Hydrodynamic and Ice Floe Movement Model", Report MIT/WHOI 86-23, Woods Hole Oceanographic Institution.

44. Bruno, M.S. and M. Muntisov, 1981. "Buoyancy-Driven Transverse Mixing in Streams", Report UCG/HEL 82/01, Univ. of California at Berkeley.

Funding

More than $50 million as either Principal Investigator or Co-Principal Investigator.

Partial List:

DHS

The National Center of Excellence in Maritime Security – $12 million (2008–2014)

DARPA

(with A. Blumberg). "Rapid Bottom Topography Mapping and Navigation in Remote and Poorly-Sampled Ocean Environments". $3.05 million (2006-2009)

Office of Naval Research

The Innovative Design and Control of Small Ships - $6 million (2002-2015)
The New York Harbor Observation System - $ 3.5 million (2003-2007)
Maritime Security - $14 million (2003-2007)
Ice-Water Resistance Force for Ice Floes - $141,000 (1994-1997)
Influence of Internal Waves on Sea Ice Motion - $106,000 (1992-1995)
Research Instrumentation Grant - $74,000 (1993-1994)
Young Investigator Award (Internal Wave Generation by Ice) - $223,000 (1991-1994)

National Science Foundation

Pan American Advanced Studies Institute (PASI): Toward a Sustained Operational River-to-Shelf Observation & Prediction System for the Amazon - $100,000 (2012)
Arctic Ocean Ice Movement Modeling in Support of Early Warning System - $54,000 (1989)

U.S. Department of Education

Improvement of Post-Secondary Science Education - $480,000 (2002-2003)
Ocean-Based Science and Mathematics Education - $500,000 (2001-2002)

U.S. Department of Transportation

Waterfront Portion of the Center for Maritime Systems - $1 million, 2002

U.S. Army Corps of Engineers

Impact on Shoreline of the Modification of Coastal Structures - $60,000 (1998-2000)
Manasquan Inlet Study - $19,000 (1996-1997)
Water Quality Modeling for the Passaic River Flood Tunnel Project - $171,000 (1994-1996)

National Oceanic and Atmospheric Administration

Sea Grant Coastal Specialist - $150,000 (1999-2005)
Influence of Human Factors on Shoreline Changes - $55,000 (1995-1998)
Reduction of Pollution in Marinas - $85,000 (1994-1996)
The Impact on Water Quality of Combined Sewer Overflows - $70,000 (1994-1995)

U.S. Coast Guard
Oil Spill Boom Behavior in Waves - $85,000 (1993-1995)

U.S. Geological Survey
Three-Dimensional Model of Pollutant Transport - $66,000 (1990-1993)

State of New Jersey
Coastal Protection Technical Assistance Service - $8,000,000 (1993-2009)
New Jersey Toxics Reduction Workplan - $580,000 (1999-2002)
Coastal Monitoring Network - $175,000 (1997-1998)
Artificial Reef Program - $280,000 (1994-1998)

New York City
Circulation and Water Quality Study of Fresh Kills Landfill - $160,000 (1990-1993)

Presentations

Numerous presentations at national and international meetings, **more than 150 invited**.

Thesis Supervisor

PhD – Richard Sheryl, New Technology for Uncontaminated and Pressure-Controlled Deep-Sea Sampler. May, 2009.

PhD – Peter Rogowski, A Technique for Optimizing the Placement of Oceanographic Sensors with Example Case Studies for the New York Harbor Region. May, 2009.

PhD – Srikanth Syamsundar, Conceptual Design of a Dynamically Reconfigurable Controller for a Multi-Role Surface Ship. May, 2006.

PhD – Soma Maroju, Performance Analysis of High Speed Vessels using Artificial Neural Networks. December, 2005.

PhD - Roy C. Messaros, A Laboratory Investigation of Bedform Geometry under Regular and Irregular Surface Gravity Waves. May, 2003.

PhD – Ms. Kathryn Ketteridge, Laboratory Study of Suspended Sediment Transport under Waves. September, 2001.

PhD – Mr. Xiao Li, A Hydrodynamic and Sediment Transport Model for Nearshore Coastal Regions. August, 2001.

PhD – Mr. Hugh Roarty, A Photographic Technique for the Measurement of Bedload Sediment Transport. April, 2001.

PhD. - Mr. Thomas Herrington, Analysis of Dominant Forcings in the Vicinity of a Tidal Inlet and Submerged Artificial Reef. June, 1996.

PhD. - Mr. Raju Datla, Interaction Between Submerged Turbulence and Surface Waves. June, 1996.

PhD. - Ms. Jennifer Waters, The Generation of Internal Waves by Sea Ice. May, 1995.

PhD. - Mr. A.K.M. Quamrul Ahsan, Three-Dimensional Modeling of Coastal Pollution Transport. January, 1993.

PhD. - Mr. Won Cho, Experimental Investigation of Surface Wave Instabilities. May, 1992.

MS – Ms Imali Kaluarachchi, Estimating the Volume and Salt Fluxes through the Arthur Kill and the Kill Van Kull. 2003.

MS - Mr. Steven Boenig, The Use of GENESIS in modeling complex shoreline dynamics. 2002.

MS – Mr. Jungu Kang, Sound Propagation in the East Sea. 1998.

MS - Mr. Sigmund Rutkowski, The Generation of Hurricane Waveforms in a Wave Tank Using Spectral Analysis. 1998.

MS - Mr. Kenneth Cadmus, The Influence of the Tide on Beach Profile Evolution. 1998.

MS - Mr. Hugh Roarty, A Photographic Technique for the Measurement of Suspended Sediment Transport. 1998.

MS – Ms. Susan Ming, Use of SBEACH Software in the Analysis of Southern California Beaches. 1997.

MS - Mr. Walter McKenna, The Effect of Man-Made Structures on Shoreline Changes at Atlantic City, New Jersey. 1997.

MS - Mr. Sherif Hassan, The Effect of a Shore-Parallel Reef on Mixing Rates in the Nearshore Region. 1996.

MS - Mr. Jun Yang, Laboratory Study of Wave Forces on a Submerged Stone Breakwater. 1996.

MS - Ms. Katherine Ketteridge, Laboratory Study of the Influence of Sand Permeability on Cross-Shore Transport. 1996.

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